

ABSTRACT OF THE DISCLOSURE

A piston type pumping apparatus comprises a vertically oriented cylinder having a top and a bottom with a first passageway for liquid in the cylinder adjacent to the top thereof. There
5 is a second passageway for liquid in the cylinder adjacent to the bottom thereof. A piston is reciprocatingly mounted within the cylinder. A hollow piston rod is connected to the piston and extends slidably and sealingly through the bottom of the cylinder. There is a reload chamber below the cylinder, the piston rod extending slidably and sealingly into the reload chamber and having a third passageway for liquid communicating with the reload chamber.
10 The piston rod has a smaller cross-sectional area within the reload chamber than the piston, whereby liquid in the cylinder acting downwardly on the piston exerts a greater force on the piston than liquid in the reload chamber acting against the piston rod. There is a first one-way valve located in the third passageway which permits liquid to flow from the reload chamber into the piston rod and prevents liquid from flowing from the piston rod into the
15 reload chamber. A fourth passageway for liquid extends from the reload chamber to a source of liquid to be pumped. A second one-way valve in the fourth passageway permits liquid to flow from the source of liquid into the reload chamber and prevents liquid from flowing from the reload chamber towards the source of liquid. There is means for storing pressurized liquid connected to the second passageway for storing pressurized liquid displaced below
20 the piston, as the piston moves downwardly, and to assist in raising the piston and, accordingly, liquid contained within the piston rod, to pump liquid upwardly and through the first passageway.